

Application Number 10/506385
Response to the Office Action dated August 15, 2008

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Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. (Currently Amended) A glass article with a metal member joined thereto, comprising:

an electroconductive coating film formed on at least a part of a surface of the glass article by baking a silver paste that includes Ag particles and a glass frit,

wherein the metal member comprises two joining planes, a leg part that bridges the two joining planes, and a connection part that projects upward from the leg part, and

wherein the two joining planes of the metal member is are fixed onto the electroconductive coating film with a lead-free solder alloy containing Sn as a main component, and

wherein when the glass article undergoes a tension test in which the metal member is pulled upward, the glass article and the metal member are ruptured because of a breakage of an inner portion of the glass article in a vicinity of a junction portion soldered using the lead-free solder and not because of a breakage of the junction portion, and

wherein the lead-free solder alloy is a Sn-Ag based alloy that contains at least 1.5 to 4 mass% of Ag, and a content of other minor components except for Sn and Ag in the Sn-Ag based alloy is 0.5 mass% or less, and

wherein the Sn-Ag based alloy has a liquidus temperature of 230°C or lower, and the difference of the liquidus temperature and a solidus temperature of the Sn-Ag based alloy is 10°C or less, and

wherein a total area of the two joining planes is in a range of 40 mm² to 45 mm².

2. (Canceled)

Application Number 10/506385
Response to the Office Action dated August 15, 2008

3. (Original) The glass article according to claim 1, wherein the electroconductive coating film is at least one selected from an antenna and a defogger.

4. (Canceled)

5. (Canceled)

6. (Canceled)

7. (Canceled)

8. (Canceled)

9. (Canceled)

10. (Canceled)

11. (Currently Amended) ~~A~~The glass article according to claim ~~[[5]]~~1, wherein with respect to each of the at least two joining planes, a volume of the lead-free solder alloy is 1.0 to 2.0 times the product of an area of the joining plane concerned and a thickness of the lead-free solder alloy, and

wherein the glass article forms no cracks after 500 times of a thermal cycle, and each thermal cycle consists of a first period of retention for 30 minutes at -30°C, a second period of raising temperature to 80°C in three minutes, a third period of retention for 30 minutes at 80°C, and a fourth period of decreasing temperature to -30°C in three minutes.

12 - 16. (Canceled)

17. (Original) A junction structure, comprising a glass article according to claim 1,

Application Number 10/506385

Response to the Office Action dated August 15, 2008

wherein a cable is connected to a connection part of the metal member, and the cable and the electroconductive coating film are connected electrically to each other.

18. (Cancelled)

19. (Canceled)